REMARKS

Independent claim 1 with associated dependent claims 2-16, 44 and 45; independent claim 18 with associated dependent claims 19 and 20; independent claim 21 with associated dependent claims 22, 23, 28-34, 46 and 47; independent claim 36 with associated dependent claims 37, 38, 48 and 49; and independent claim 42 with associated dependent claim 43, remain in the application. New claims 50, 51, and 52 depending indirectly from independent claim 1, are also presented.

The invention as defined in all independent claims is directed to the introduction of NaOH AP after a primary pressurized (independent claims 1, 18, 21, 36), or secondary and/or tertiary (claim 42) refiner before further processing, in combination with applying NaOH AP impregnation pre-treatment to lignocellulosic material before refining. The addition after the refiner, is to the stream of pulp in the blow line. Whereas the intermediate line extends from the refiner to the retention vessel or tower, the blow line extends between the blow valve and the next processing apparatus, such as a pulp separator (see par. [0042] of the published application).

Claims 20 and 21 were again rejected under 35 USC §112, in that the examiner maintains that the term "few" in the description does not support a specific recitation of "three". Applicant has amended these claims to recite "immediately after", and relies on the description at par. [0043] ("immediately (from less than a few inches to a few feet") as guiding one skilled in the art as to the scope of these claims.

Claims 1-11, 18-23, 28-29, 36-39 and 42-49 currently stand rejected under 35 USC §103 on the basis of the disclosure of U.S. 6,743,332 (Haynes) in view of the disclosure of the technical paper of Cannell, further in view of the disclosure of U.S. 4,486,267 (Prusas). These claims were previously rejected on the same references, but in the order Prusas, Haynes, and Cannell.

It appears to Applicant that the Examiner is applying hindsight based on Applicant's disclosure, to construct the rejection from three disparate references. Applicant clearly describes (and claims) that the addition of chemicals after the refiner at the blow line (see publication paragraphs [0010] and [0011]) in combination with the use

of the same chemicals in pretreatment is important for optimizing the use of the chemicals and influencing brightness and pulp properties.

Applicant adds chemicals in the blow line to allow for a mixing of chemicals and cellulosic material without the agitation of the refiner or other mechanical action. This non-mechanical mixing in the blow line allows for chemicals to enter the wood and be present in the slurry as it enters the retention vessel without mechanical agitation.

It is known in the art that the alkaline peroxide chemicals perform specific roles when used in the inventions disclosed in the Haynes and Prusas patents. These patents also suggest the use of these chemicals can be detrimental to pulp. Applicant's invention identifies a new and inventive method that allows for the improved use of the alkaline peroxide chemicals in very specific locations, i.e., at the pretreatment and in the blow line. By using the chemicals in these two locations Applicant secures the advantages of pretreatment (pressing and impregnation) with alkaline peroxide (softening the chips to allow better separation of the fibers during refining and the beginning of the bleaching of the material) without the disadvantages of adding too much alkaline peroxide in the refining stage where metals present can cause other problems as well as avoiding the problem of having too much alkaline which can cause darkening and then requiring additional peroxide or other bleaching chemicals later in the process. Applicant's invention allows for the "proper" amount of alkaline peroxide to be added for pretreatment to obtain the desired softening and bleaching, while additional alkaline peroxide can be added in the blow line before the bleaching tower to continue the advantageous bleaching of the pulp.

In the Haynes patent, the entire discussion is directed to high temperature bleaching of pulp, by adding bleaching chemicals to refiners or the interstage between refiners. In the paragraph beginning in col. 11, ln. 8, Haynes defines interstage as "referring to the section of the pulping system, including any associated equipment or the like, beginning with the exit of the first stage refiner and ending at the entrance to the second stage refiner". In Fig. 2, Haynes shows introduction of bleaching liquor after the primary refiner 216 among a number of other locations, all before the second refiner 222, but no bleaching vessel. In Figure 3, Haynes shows chemical introduction at the first refiner 324, but not immediately after the refiner. Instead, a blow unit 332 is

interposed between two cyclones 328 and 338, where chemicals can be introduced at 336 or 342, followed by a bleaching vessel 348, before the pulp is delivered to the second refiner 362. There is no subsequent bleaching.

Haynes does not suggest the addition of bleaching chemicals immediately after the refiner in the blow line before any further processing, followed by e.g., a high consistency bleaching tower.

Although Haynes discloses adding AP to the intermediate line while the primary pulp is above 80 deg. C, mixing, and discharging to a retention vessel, Haynes does not disclose any AP pretreatment (i.e., pressing and associated impregnation) upstream of the refiner. Haynes may disclose (e.g., col. 12 lns. 39-42) addition of AP associated with the refiner (such as 263 at preheater 210, 261 at feed conveyor 220, or 260 directly into refiner 216), but there is no disclosure, teaching or suggestion of the kind of pretreatment claimed by Applicant.

On page 3 of the outstanding official action, the examiner states that the Cannell reference "was used to provide a general teaching of a typical BCTMP process generally known to those of ordinary skill in the art". Likewise, on page 2, the examiner states that "Prusas et al is only used to teach what was generally known to one of ordinary skill in the art at the time of the invention".

Thus, the rejection of all claims is premised on (1) Haynes as a basic reference that allegedly addresses an analogous problem or objective, by introducing AP at multiple points in a refining line and (2) general knowledge possessed by one of ordinary skill as exemplified by the Cannelll paper and the Prusas patent. The rejection is not based on any nexus of teachings, suggestions or motivations among the references for combining the NaOH AP pretreatment and the NaOH AP blowline introduction claimed by Applicant, but rather on the general knowledge motivating one of ordinary skill to modify Haynes in a manner resulting in Applicant's claimed invention.

Applicant acknowledges that NaOH AP pretreatment is known, but without any teaching of subsequent NaOH AP introduction at the refiner or in the blowline immediately following the refiner. Applicant acknowledges that it is known to introduce AP in the refiner feed train, at, and after the refiner, but not in combination with AP pretreatment before the refiner. Nothing of record, however, provides any motivation for

one of ordinary skill to optimize the distribution and total quantity of NaOH AP as between pretreatment and blowline.

The Cannell article discloses an APP (Alkaline Peroxide Pulp) process where alkaline peroxide is added at impregnation with additional peroxide added after refining. The article does state the addition of alkaline/peroxide chemicals can be split between impregnation and post bleaching. While this statement suggests use of alkaline and peroxide in the impregnation stage, it does not teach or suggest introduction at the blow line just after the refiner. Not only is there no teaching of introducing the bleaching solution in the blowline, but the figures suggest that only peroxide is added in the second location. If a second alkaline peroxide introduction were considered important to the process, the author would have stated so.

In the Prusas the object is to pretreat with an alkaline or alkaline peroxide chemical to soften the chips (column 5 lines 65 to 68) enabling the fibers to be more easily separated during mechanical defibration step later in the process. This is similar to Applicant's alkaline peroxide treatment pretreatment. But in Prusas it is important that the once impregnated material is impregnated again (after having removed the first, AP impregnation material) the material is "cooked" with a sulfite liquid. While these two chemical treatments are impregnation steps and both are before the refiner, they do not in any way suggest the combination of pretreatment with alkaline peroxide before the refiner and further introduction of alkaline peroxide in the blow line after the refiner. Whereas it is suggested that the combination of chemicals used in the two pre-refiner pretreatment stages can influence the ultimate bleachability of the material, there is no suggestion that chemicals can or should be of benefit if added to the blow line after the refiner.

Prusas removes all AP after first stage pretreatment, but does not remove (merely drains, col. 6, ln. 65) the sulfite liquor on the chips before refining. There is no thought in Prusas of any continuity or carrying over any AP from pretreatment to refining. Haynes uses an alkali that differs from but allegedly gives the same brightness as NaOH. Haynes states that the advantages result when the alkalinity is not from NaOH.

Thus, both Haynes and Prusas are trying to eliminate NaOH in the refiner and blow line, whereas Applicant is trying to improve the effectiveness of NaOH as used with peroxide throughout the pretreatment, refining, and post refining processes.

Haynes shows refiner AP and post refiner (intermediate line) AP introduction, but no pre-refiner AP impregnation and no emphasis on the blow valve. Cannell suggests use of alkaline and peroxide in the impregnation stage, but as the examiner has acknowledged, does not teach or suggest introduction at the blow line just after the refiner. Prusas also shows pre-refiner AP impregnation and conventional post-refiner bleaching, with no suggestion of blow line introduction. There is no teaching or motivation in the record to combine the pre-refining impregnation using AP with introduction of AP in the intermediate line before any further processing (claims 36 and 42), and especially no such teaching for introducing the AP in the blow line at or within a feet after the blow valve (claims 1, 18, 21).

Applicant emphasizes with respect to independent claims 1, 18, and 21, the recitation that the NaOH AP solution is introduce in the blow line, preferably immediately after the blow valve, which is the ideal location for thorough mixing of the AP solution with the pulp emerging from the refiner. As set forth in paragraph [0010], when a substantial fraction of the overall NaOH AP (at least one third) is applied at or near the blow valve in the post refiner intermediate line, in combination with the NaOH AP impregnation of the chips upstream of the refiner, and especially when NaOH AP is also introduced at the refiner, better energy efficiency and more efficient bleaching are achieved relative to the application of all the chemicals before discharge from the refiner. By moving a greater number of chemical reaction downstream relative to conventional techniques, with the improved mixing at the blow valve or at least the blow line, the AP can perform its chemical bleaching with far less a degradation which would other wise occur with AP introduction at or upstream of the refiner in a high pressure refining system. The last paragraph of the Technology Update section of Cannell, implies that in the APP process the front end needs high loading of the AP. Applicant's preferred introduction of at least one third at the AP at the blow line addresses this problem.

The effectiveness of the AP introduction at the blow line is very much dependent on the pretreatment steps recited in Applicant's claims. Thus, not only is there no disclosure in any one reference of NaOH AP pretreatment including pressing and impregnation upstream of the refiner, followed by NaOH AP addition in the blow line, but furthermore, there is no basis among the references for one of ordinary skill to appreciate the particularly efficacious results arising from the combination of such pretreatment with such blow line addition. This is not an arbitrarily selected combination, in that Applicant does not assert that introduction of NaOH AP at the refiner followed by NaOH AP in the blow line, without NaOH AP pretreatment, provides any of the special advantages of the claimed invention.

Claim 5 recites that the step of mixing is immediately followed by introducing the mixture into a separator and the separated pulp is then discharged into the retention vessel. The most efficacious embodiment of Applicant's invention is represented in Figure 11, consistent with claims 2, 3, 5, 6, 8, and 9. New claims 50, 51, and 52 incorporate various of these features and have been added as most distinguishable from any plausible combination of references of record. Moreover, these claims highlight the greatest advantage, where in a high pressure refining line, the AP is used most cost-effectively, in providing satisfactory pulp properties despite the high temperature, as summarized in par. [0012], [0013], and [0100]. In particular, claim 52 is most closely associated with Example Set C and par. [0100]. (Note that "intermediate line" as used therein is "immediately after refining" (see last sentence of par. [0094]).

For these reasons, Haynes, Cannell, and Prusas, are not properly combinable, and the rejection of claims 1-11, 18-23, 28-29, 36-38 and 42-49 on this basis should be withdrawn, and claims 50-52 should be allowable.

Claims 12-16 and 30-34 were rejected under 35 U.S.C. §103 on the basis of Haynes, Cannelll and Prusas, plus the disclosures of three other patents or publications. These claims depend indirectly from one of the independent claims 1 or 21. At this time, Applicant repeats the point that the fundamental basis for the rejection, the combination of Haynes, Cannell, and Prusas is fatally flawed. Therefore, if the independent claims 1 and 21 are patentable over the cited combination under 35 U.S.C.

§103, claims that depend directly or indirectly from claims 1 or 21 are likewise patentable under 35 U.S.C. §103.

For the foregoing reasons, Applicant believes all claims are in condition for allowance.

Respectfully submitted,

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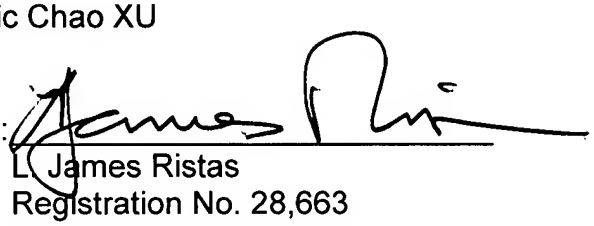
By: 

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